Photography: DWR

California's Drought Update

June 30, 2010

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California's Drought Update

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Introduction

This drought bulletin provides a monthly update to California's water conditions. In the spring when seasonal precipitation typically declines statewide after March, there is increased interest in reservoir storage conditions and runoff forecasts to assess available water supplies. In April and May however, the snowpack increased, significantly improving the water supply outlook. The total statewide October through May precipitation was 107 percent of average.

Information in the update is based on hydrologic data compiled through the end of May 2010, with more current information provided for selected reservoirs and indices. This month's report includes: updated information on hydrologic and water supply conditions; comparisons to historical drought conditions; water supply allocations; and local drought impacts by hydrologic region. Additional drought information can be found on the drought website (http://www.water.ca.gov/drought/).

Hydrologic and Water Supply Conditions

Precipitation

The 2009 Water Year (October 1, 2008 through September 30, 2009) was the third consecutive year of below average precipitation for the state. Annual statewide precipitation totaled 76 percent, 72 percent, and 63 percent of average for Water Years 2009, 2008, and 2007, respectively.

Table 1 compares the average monthly contribution to statewide precipitation to the observed precipitation from Water Years 2009 and 2010 (to date). In Water Year 2009, January, April, July, August, and September were exceptionally dry while February, May, and June, were well above average. Water Year 2009 finished at 76 percent of an average water year. Water Year 2010 through May stands at 107 percent of average. In Water Year 2010, November was exceptionally dry while October, January, April, and May were well above average.

Month of Water Year	Avg CA Precip (inches)	WY 2009 Observed	% of Average	WY2010 Observed	WY 2010 % of Avg
October	1.22	0.73	60%	2.16	177%
November	2.80	2.49	89%	0.79	28%
December	3.91	3.05	78%	3.43	87%
January	4.35	1.26	29%	6.75	155%
February	3.66	5.06	138%	3.66	99%
March	3.12	2.13	68%	1.92	61%
April	1.64	0.59	36%	3.21	196%
May	0.89	1.47	165%	1.18	133%
June	0.35	0.46	133%		
July	0.18	0.02	11%		
August	0.28	0.06	20%		
September	0.48	0.09	19%		
Total	**22.88**	**17.40**	**76%**	**23.11**	**107%**

Table 1. Average statewide precipitation by month with statewide precipitation values from Water Years 2009 and 2010. Data from California Climate Tracker (Western Region Climate Center): http://www.wrcc.dri.edu/monitor/cal-mon/frames_version.html

Sea surface temperatures continue to decrease across much of the Pacific Ocean with El Niño/La Niña neutral conditions across the equatorial Pacific. Conditions are favorable for a transition to La Niña conditions during June – August 2010 based on the June 21 update by NOAA's Climate Prediction Center (CPC). The CPC's June 17 1-month outlook for July suggests increased chances of above normal temperatures for the southeastern region of California and below normal temperatures for the northwest region. The 1-month precipitation outlook issued the same day suggests increased chances of above normal precipitation for the northwest region of California. The CPC's June 17 90-day outlook suggests increased temperatures for southeastern California and equal chances of above and below normal precipitation for all of California.

The Northern Sierra 8-Station and San Joaquin 5-Station Precipitation Indices track the wetness of the Sacramento and San Joaquin River basins. These indices help correlate the health of the runoff into Central Valley reservoirs. In general, April and May have been wet and cool, due to a series of cold, late-winter storms that brought significant precipitation to the state. In June however, the precipitation fell below the total monthly average to about 40 percent as of June 21 for the 8-Station Index. As of June 21, the 8-Station Index is at 110 percent of average to date with the 5-Station Index fairing slightly better at 115 percent of average as of June 23. Note that with significant seasonal precipitation ending, the precipitation for the 8-Station and 5-Station indices will both likely end the Water Year with above the average annual precipitation. The annual average for the 8-Station Index is 50 inches and the 5-Station Index is 40.8 inches. Figures 1 and 2 compare 2010 Water Year precipitation with the other water years for the 8-Station Index and 5-Station Index, respectively.

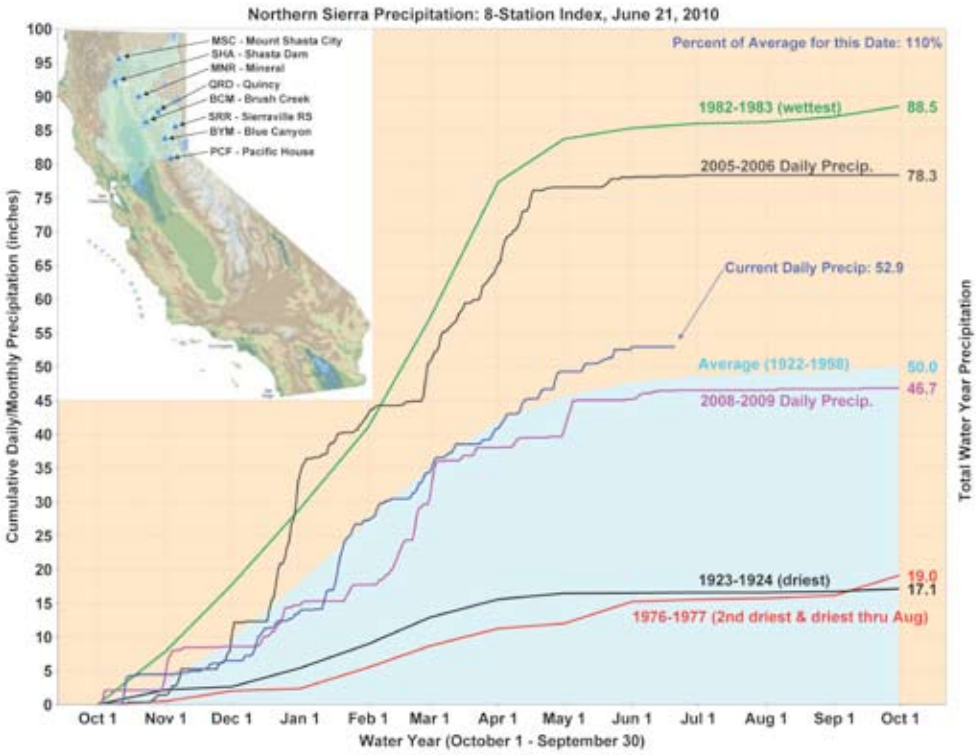

Figure 1. Northern Sierra 8-Station Precipitation Index

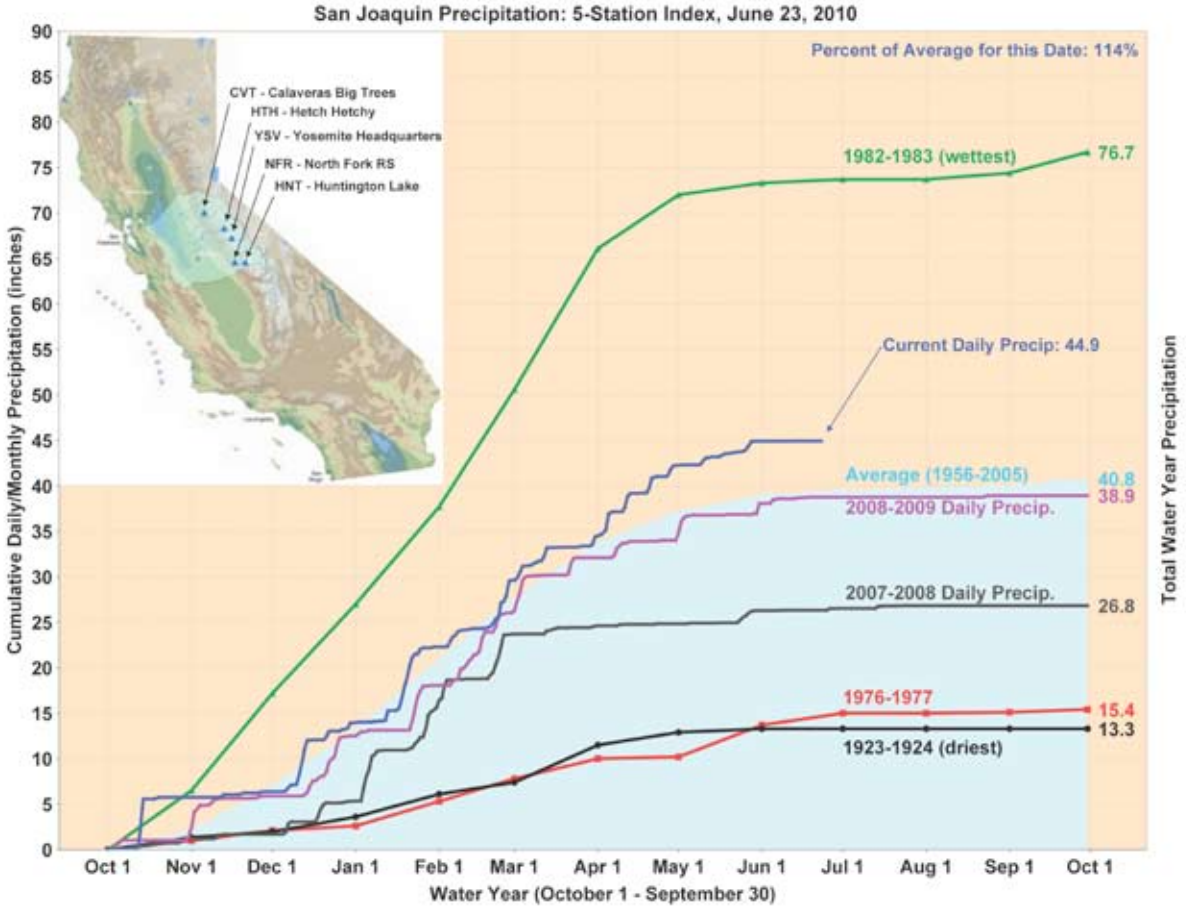

Figure 2. San Joaquin 5-Station Precipitation Index

Reservoir Storage

Statewide reservoir storage at the end of Water Year 2009 was over 17 MAF or about 80 percent of average and 46 percent of capacity for the date, with individual key reservoirs much lower. Statewide reservoir storage on May 31, 2010 was 27.9 MAF which is about 95 percent of average and 74 percent of capacity. Figure 3 shows the condition of the state's larger reservoirs as of midnight on June 23, 2010.

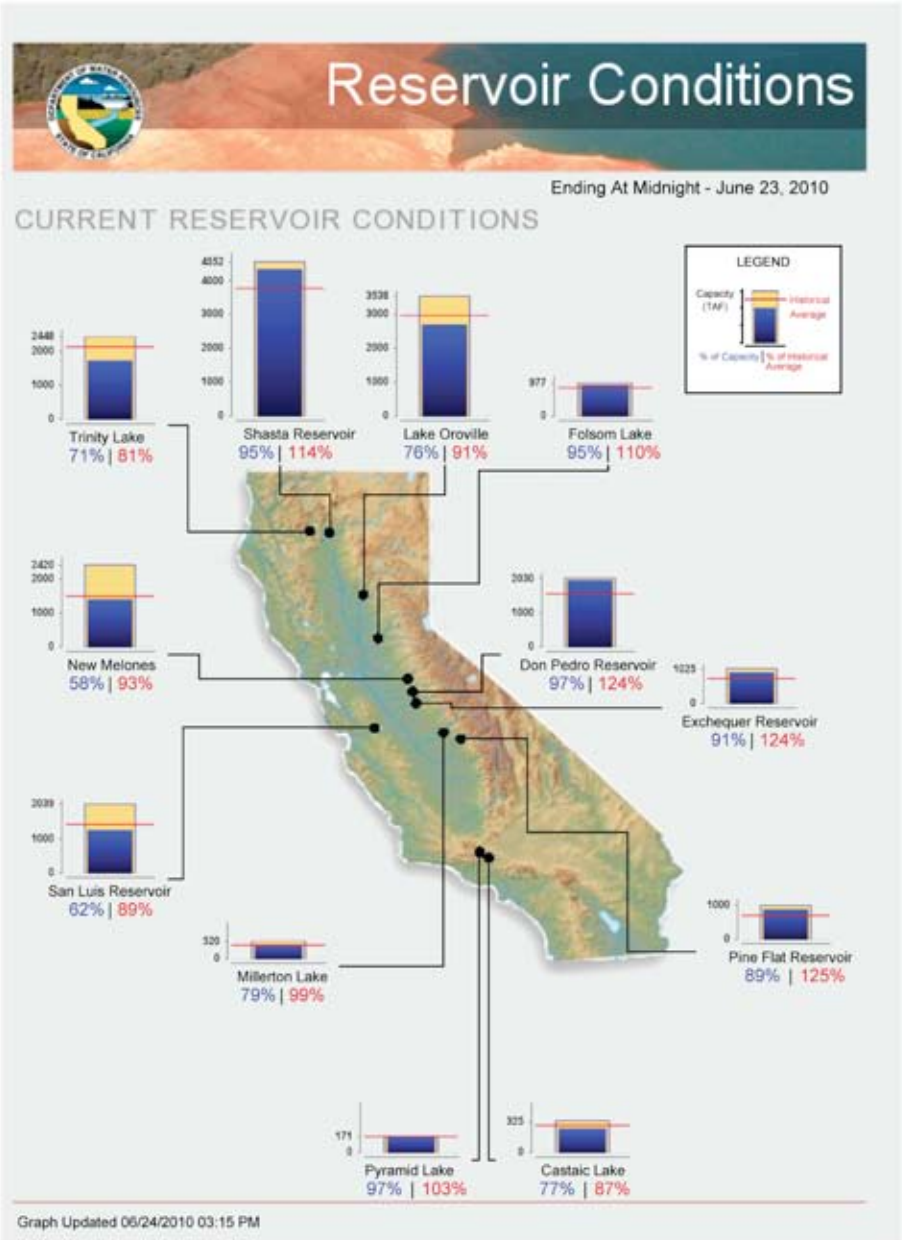

Figure 3. Reservoir storage for select reservoirs shown as percent of capacity (blue) and percent of average (red).

Source: http://cdec.water.ca.gov/cgi-progs/products/rescond.pdf

Figure 4 shows detailed reservoir conditions at Lake Oroville, a major water supply for the state which is below average conditions but above last year's storage at this time.

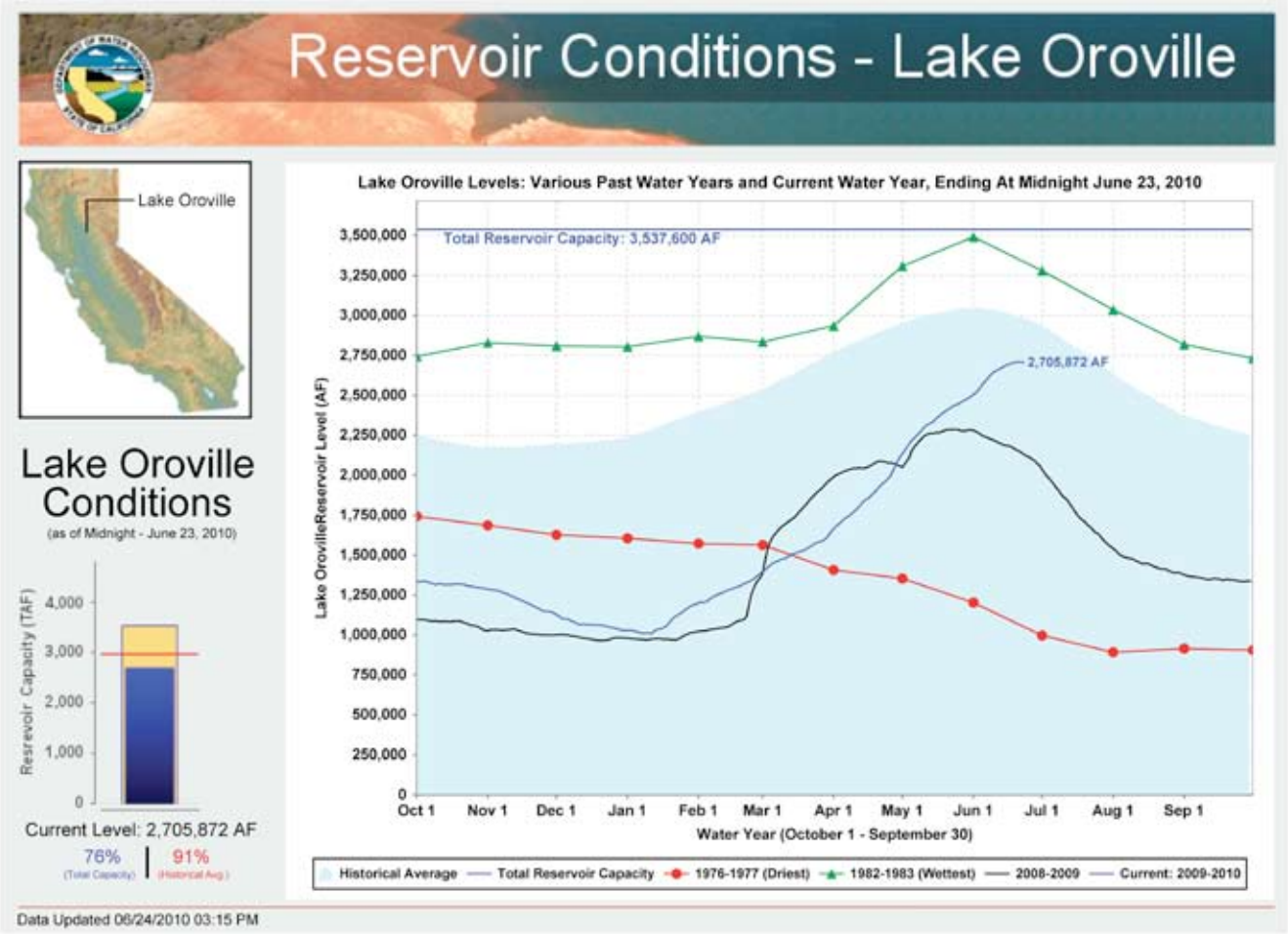

Figure 4. Detailed reservoir conditions for Lake Oroville.

Source:http://cdec.water.ca.gov/cgi-progs/products/rescond.pdf or http://cdec.water.ca.gov/cgi-progs/reservoirs/RES/

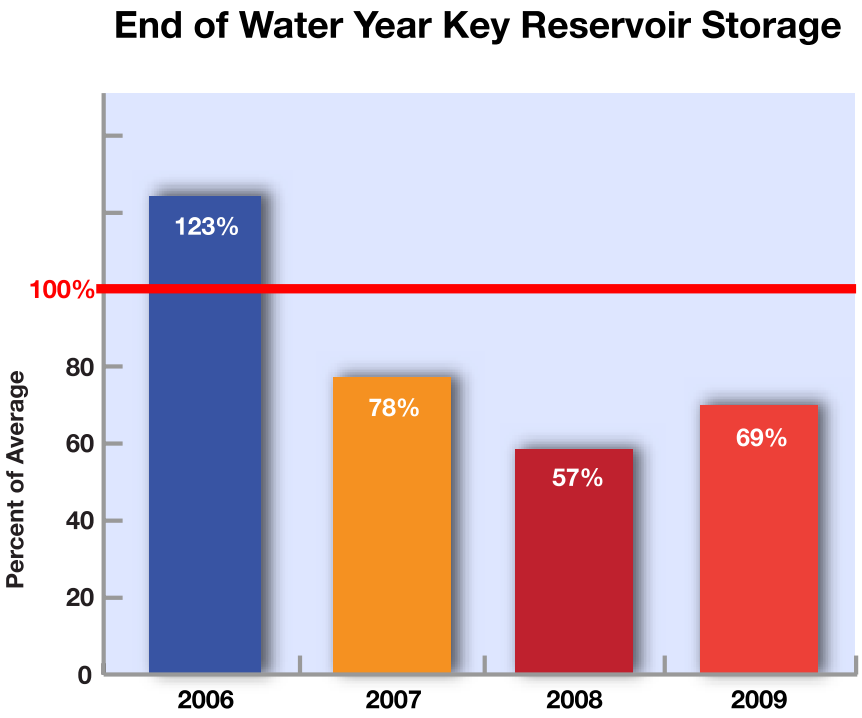

Figure 5. Percent of average end of water year storage for key reservoirs from 2006-2009. ("key reservoirs" comprise Trinity, Shasta, Oroville, Folsom, Don Pedro, New Melones, and San Luis reservoirs)

Figure 5 shows storage for key reservoirs for the end of the last four water years. The three-year drought, from 2007 to 2009, was evident in the well-below normal storage readings. The state entered the 2009-2010 Water Year with its key supply reservoirs at only 69 percent of average however, as of June 23, 2010, the summation of storage in the "key reservoirs" improved to 101 percent of average.

Runoff

Figure 6 shows a comparison of the percent of average annual statewide runoff from Water Years 2006 through 2010 (the 2010 value includes only runoff from October through May and will be updated throughout the Water Year). Water Year 2006 was the most recent wet year in California, with 173 percent of average statewide runoff. Water Year 2007 was the first of three dry years, ending with 53 percent of average statewide runoff. Water Year 2010 stands at 79 percent of average to date (through May). Major Sierra rivers are flowing at rates well above 100 percent of average from June 1 through June 16.

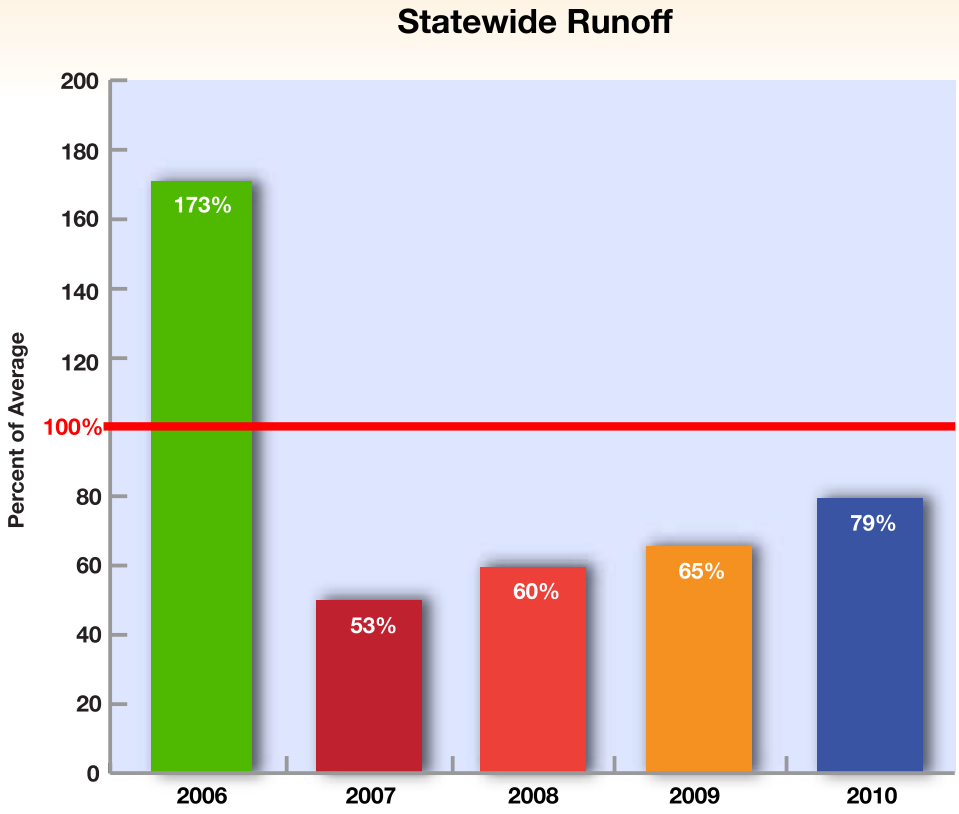

Figure 6. Statewide runoff for water years 2006, 2007, 2008, 2009 and 2010 (through May 31, 2010)

Table 2 shows the Sacramento and San Joaquin River Runoff, WSI and year type for select water years based on observed runoff at the end of the Water Year. This table also includes the official May 1, 2010 Water Year forecast (not observed runoff) for the Sacramento and San Joaquin River Runoff, WSI, and Year Type used to implement the State Water Resources Control Board Decision D-1641.

	Sacramento River			San Joaquin River		
Water Year	Runoff MAF	Index	Year Type	Runoff MAF	Index	Year Type
2006	32.09	13.2	W	10.44	5.9	W
2007	10.28	6.2	D	2.51	2.0	C
2008	10.28	5.2	C	3.50	2.1	C
2009	12.91	5.8	D	4.97	2.7	BN
2010[1]	15.60	6.9	BN	6.20	3.5	AN

[1] May 1, 2010 Water Year forecast for implementing D-164

Table 2. Sacramento and San Joaquin river runoff, WSI, and year type for select water years based on observed data (W=wet, D=dry, C=critical, BN=below normal) observed data (W=wet, D=dry, C=critical, BN=below normal)

The May 1, 2010 Water Year forecast for the Sacramento River Unimpaired Runoff was 15.6 million acre-feet (MAF) and the San Joaquin River Unimpaired Runoff was 6.2 MAF. Both runoff estimates under future forecasts are likely to remain the same or increase due to above average precipitation during May in the Sacramento River and San Joaquin River basins. Updated forecasts of runoff for major Sierra Rivers are posted by the California Cooperative Snow Surveys section and available at http://cdec.water.ca.gov/cgi-progs/iodir/B120UP

Figure 7 shows the forecast of April through July unimpaired runoff as a percentage of historical average for selected Sierra river basins as of June 15, 2010. Most of the basins are forecast to have above normal runoff. (Note: These updated runoff forecasts do not change the Water Supply Index forecasts as shown in Table 2.)

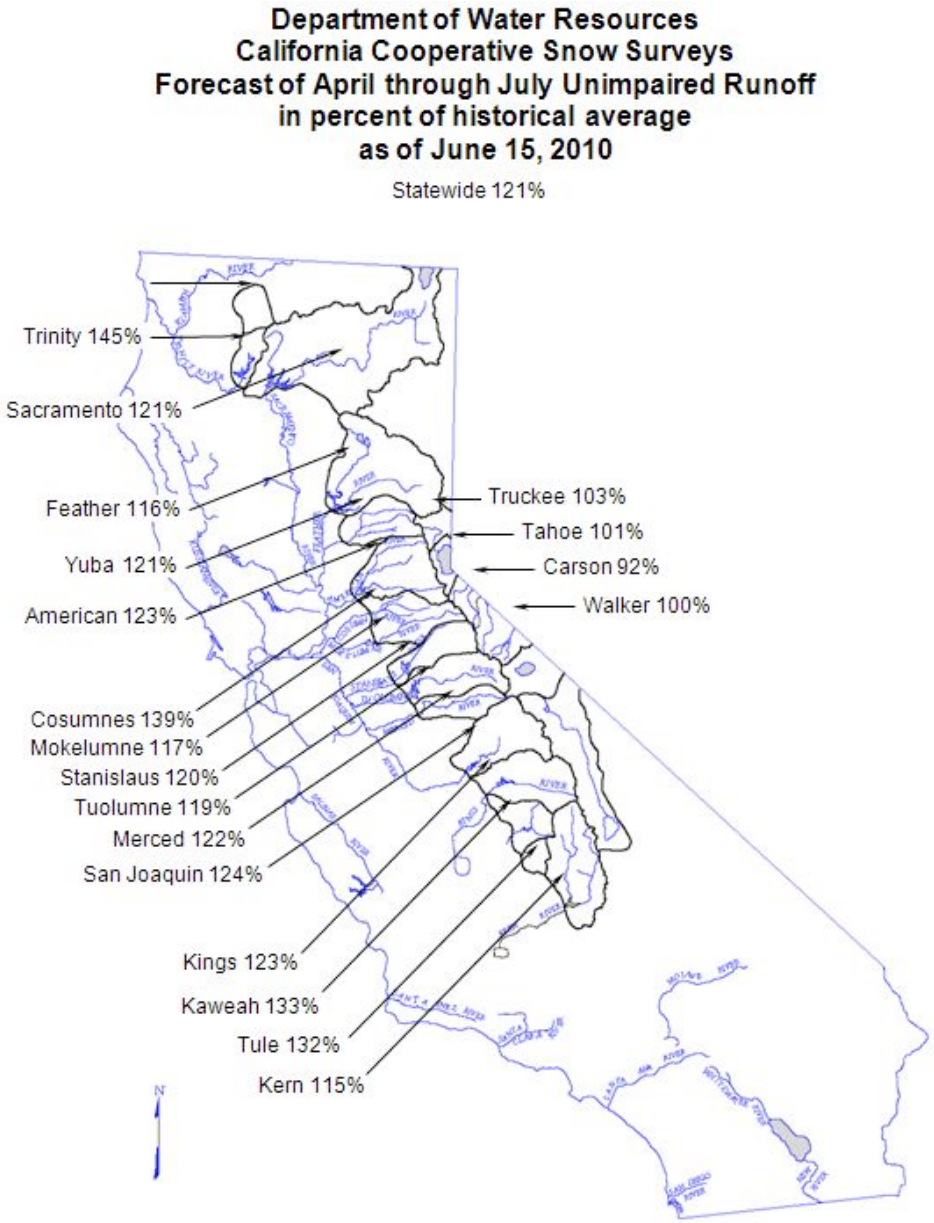

Figure 7. June 15, 2010 April through July Unimpaired runoff percentage of historical average for California.

Source: DWR Snow Surveys Section, Hydrology Branch, Division of Flood Management

State Water Project Allocations

On June 23, 2010 the Department of Water Resources (DWR) adjusted its final 2010 State Water Project (SWP) allocation to 50 percent of requested amounts because of late Sierra storms in April and May. The SWP allocation had been set at 20 percent of contractors' requests earlier in April, increased to 40 percent on May 4, and 45 percent on May 20. The initial 2010 allocation estimate, made back in December 2009, was 5 percent. That projection rose incrementally as snowpack accumulated during winter and spring and SWP operations are finalized.

Even with a return to normal precipitation and reservoir levels, and an above normal Sierra snowpack, SWP deliveries will remain limited due to current restrictions on Delta pumping to protect native fish species. The 50 percent allocation, although a dramatic increase from the amount originally estimated for this year, will still leave many communities, farms and businesses with limited alternative supplies.

Lake Oroville in Butte County, the SWP's principal supply reservoir, stands at 76 percent of capacity and 91 percent of average as of June 23, 2010. But fishery agency restrictions on Delta pumping to protect salmon, Delta smelt and other species continue to constrain water deliveries to the Bay Area, San Joaquin Valley, Central Coast and Southern California. DWR estimates that fishery restrictions this year will impact SWP deliveries by 800,000 acre-feet.

In 2009, the SWP delivered 40 percent of the amount requested by the 29 public agencies with long-term contracts to buy SWP water. The SWP contractors deliver water to about 25 million Californians and 750,000 acres of irrigated farmland. A notice to SWP contractors appears on DWR's State Water Project Analysis Office Web site at: http://www.swpao.water.ca.gov/notices.

DWR, in partnership with the Association of California Water Agencies, will continue to run the Save Our Water program. The program, which was created by Gov. Schwarzenegger's 2009 drought declaration, aims to educate Californians about easy ways to conserve water indoors and outdoors. Visit the Web site at: http://www.saveourh2o.org.

Central Valley Project Allocations

On June 14, 2010, the Bureau of Reclamation (USBR) announced an increase in the Central Valley Project (CVP) 2010 water allocation. The updated allocations are based on hydrologic conditions as they existed as of June 1, 2010, and the California Department of Water Resources snow survey and runoff forecast.

For CVP agricultural water service contractors north of the Delta, the water supply forecast remains at 100 percent, and the water supply forecast for Municipal and Industrial (M&I) water service contractors north of the Delta remains at 100 percent. For agricultural water service contractors south of the Delta, the water supply forecast increases from 40 percent to 45 percent, while the water supply forecast for M&I users south of the Delta remains at 75 percent allocation. The Class 2 water supply forecast for Friant Division contractors remains at 30 percent; the Class 1 water supply forecast for Friant Division contractors remains at 100 percent.

The allocations for the Eastside Division agricultural contractors (Stanislaus River), settlement contractors with claims to senior water rights along the Sacramento and San Joaquin Rivers, and Wildlife refuges allocation (Level 2 water) north and south of the Delta remain at 100 percent. The improved allocation is based on improved storage and runoff into the CVP reservoirs.

Detailed information about the initial 2010 Central Valley Project water supply forecast can be found at the USBR website: http://www.usbr.gov/mp/pa/water.

Local Impacts and Responses to the Drought

Based on the results of economic forecast models used by DWR, which used CVP deliveries announced as of June 16, 2010, and SWP deliveries announced as of June 23, 2010, as well as current assumptions about local water conditions, no shortage-related losses to irrigated agriculture are expected in the Sacramento Valley. Reduced SWP and CVP deliveries however, are expected to bring about job and income losses in the San Joaquin Valley in 2010. An estimated 5,067 to 5,359 jobs will be lost, with income losses between $345 and $365 million.

These employment and income losses include those arising from impacts on businesses in the San Joaquin Valley both directly and indirectly related to farm production. Furthermore, groundwater pumping costs are forecasted by DWR modeling to increase by an estimated $103 to $105 million as San Joaquin Valley farmers substitute groundwater for the unavailable SWP and CVP supplies. Losses associated with drought-affected dryland range and pasture, unirrigated crops, livestock operations, and dairies are excluded from the estimates.

For both the Sacramento and San Joaquin Valleys, these estimates also exclude any losses associated with crop planting decisions made based on earlier, much more unfavorable forecasts of SWP and CVP deliveries and assumptions about local water supply conditions. Any losses arising from such decisions however, will be partially mitigated by the reduction in farm pumping costs resulting from the additional availability of surface water.

North Coast Hydrologic Region — As reported in last month's drought update, drought conditions in the Klamath Basin continue to severely impact Klamath Project water users in both Oregon and California. On May 4, 2010, the Bureau of Reclamation's Klamath Basin Area Office released the annual Operations Plan for the Klamath Project. The Operations Plan takes into account the needs of the Endangered Species Act (ESA) listed species and tribal trust in Upper Klamath Lake, Klamath River, and Clear Lake and Gerber Reservoirs, while also meeting the needs of the downstream fishery.

Reclamation has determined that there will be sufficient water to make limited project releases from Upper Klamath Lake and Gerber Reservoir. The 2010 Operations Plan estimates 30 to 40 percent of average annual releases or approximately 150,000 acre-feet of water will be available to Upper Klamath Lake irrigators. The releases will begin once the lake level reaches a level protective of endangered suckers and is expected to remain above that level for the remainder of the irrigation season.

Gerber Lake's forecasted inflow and carryover will allow a release of approximately 85 percent of the average annual supply or an estimated 31,000 acre-feet. Clear Lake Reservoir carryover storage and forecasted inflow indicate there will be no available water for irrigation releases in 2010. More information on the Klamath Project, including the 2010 Operations Plan can be found at http://www.usbr.gov/mp/kbao.

The Department of Interior announced that additional funding has been given to the Klamath Water and Power Agency to implement a program that includes both groundwater pumping and land idling components, which will provide relief to irrigators during what is shaping up to be a very difficult water year. The Klamath Water and Power Agency administers the groundwater pumping program, often referred to as the "Water Bank", and land idling program on the Klamath Project. DWR is working with the Oregon Water Resources Department to monitor groundwater levels throughout the region.

The Sonoma County Water Agency and the municipalities to which it supplies Russian River water are under a State Water Resources Control Board Order (SWRCB) order to put commercial landscapes with dedicated meters on water budgets that dramatically limit irrigation by December. The May 24 order from the SWRCB calls for a maximum applied water allowance of 60 percent of climate-specific irrigation needed by the same area of turf in previous years. The order resulted from the water agency's required cutback under federal regulatory policy in reservoir water releases into the Russian River and tributaries to boost populations of young protected salmon.

San Francisco Bay Hydrologic Region — The Marin Municipal Water District (MMWD) reported on June 20 that its seven reservoirs are at 96 percent capacity. MMWD continues to encourage its customers to conserve water. Due to lack of funding, MMWD's water conservation rebate programs have been suspended for the remainder of this fiscal year (June 30). As of June 23, storage in Santa Clara Valley Water District (SCVWD) reservoirs is at 70 percent of capacity; the SCVWD is asking everyone in the county to continue to conserve water and reduce water use by 15 percent. The East Bay Municipal Utility District (EBMUD) reservoirs are at about 94 percent full as of June 22; EBMUD customers are asked to continue to conserve their water usage. Storage in Lake Mendocino, a water supply for Sonoma County Water Agency, is 86 percent full as of June 22.

Sacramento River Hydrologic Region — Yolo County Flood Control and Water Conservation District (YCFC&WCD) will be having a shortened irrigation season this year due to improvements to Capay Dam; starting in September Cache Creek flows will be greatly reduced. Indian Valley Reservoir and storage behind the Clear Lake Dam are both at 32 percent of capacity, but these supplies, plus the late spring rains will provide sufficient water supplies to YCFC&WCD customers through the irrigation season. El Dorado Irrigation District (EID) Board of Directors voted to end their Stage 1 Drought Declaration because of the wet spring and the decision by USBR to allocate 100 percent of EID contracted supplies from the CVP. The lifting of the declaration means the district's service area is now at drought management Stage 0, which approximates normal conditions. EID continues to encourage customers to conserve water supplies.

North Lahontan Hydrologic Region — Lake Tahoe's water level is about 1.5 feet above the natural rim (elevation 6223 feet) as of June 24 and is expected to continue above the rim until the end of the calendar year. Although precipitation for the year was normal in the Truckee River drainage basin, the supply deficit from 3 years of drought will not be recouped without a few more years of normal to wet winters.

South Coast, South Lahontan, and Colorado River Hydrologic Regions — Even with the above average seasonal precipitation this past winter and spring, water managers across Southern California are aware that water supply shortages are not over. Local water agencies are educating the public about water supply conditions and that shortages are likely to continue into the foreseeable future due to environmental challenges in the Sacramento-San Joaquin River Delta. They are also emphasizing that next year could be dry and many of the local major reservoirs have yet to recover.

Due to water shortage concerns across the region, local agencies are keeping water conservation ordinances and water use restriction policies in place while encouraging customers to continue to be efficient with their water use, fix sprinklers for over-spray and leaks and replace plants or shrubs with drought-tolerant "California Friendly" species. Despite the harsh economic climate, local agencies have found a way to maintain or establish new incentive programs to encourage conservation. Also, many agencies are increasing their commitment to providing expanded public information and education programs.

The San Diego County Water Authority is strengthening its conservation effort by promoting drought messages that shift from conventional metrics such as the cash rebate programs to permanent behavior and water-use changes to ensure sustainable supply. To this end, the agency is planning to implement an extensive regional outreach program designed to change public perception to one that views water conservation as a way of life and sees water efficient measures as desirable and cost-effective.

DWR 2010 Water Transfers

DWR is collaborating with USBR to facilitate 2010 water transfers and respond to water shortages. Water will be transferred using SWP or CVP facilities to water suppliers that are at risk of experiencing water shortages and that require supplemental water supplies to meet anticipated demands. The total transfer amount for 2010 is 232,527 acre-feet.

The transfers include the Yuba Accord transfer for 131,000 acre-feet with a possible additional amount of 2,000 to 8,000 acre-feet later in September or October. The total transfer amount for 2010 outside of the Yuba Accord is currently calculated at 101,527 acre-feet. This total may be subject change as more information becomes available and further refinements are made. Four SWP contractors are participating in the 2010 water transfer program.

On June 23, 2010 the SWP final allocation was adjusted and raised from 45 percent to 50 percent of the requested amount. This change will have no impact on SWP capacity that could be made available for transfers but is subject to change, if needed.

Fresno County Drought Assistance

As reported last month, in response to the continuing impacts of drought, Fresno County restarted its emergency food distribution program on May 19. The food distribution occurs twice a month in four cities and is expected to continue until the end of the calendar year. The Department of Social of Social Services estimates that up to 15,000 individuals are served every two weeks, or the equivalent of 30,000 individuals each month.

Summary

Cold Pacific storms in April and May significantly improved water supply outlook conditions with precipitation and snowpack conditions statewide well above average. The forecast as of June 15 for spring runoff from April through July is expected to be well above average at 121 percent statewide. The runoff forecast for the 2009-2010 Water Year is also expected to be near normal at 90 percent of average statewide based on the May 1 forecast. The increased runoff has helped reservoir storage conditions statewide with Lake Oroville, a major water supply reservoir for the State at 91 percent of average as of June 23, 2010.

As a result of improved water supply conditions in the Sacramento and San Joaquin hydrologic regions, both the Central Valley Project and State Water Project increased their water delivery allocations in June however, even with a return to normal precipitation and reservoir levels, and an above normal Sierra snowpack, SWP deliveries will remain limited due to current restrictions on Delta pumping to protect native fish species. In addition, allocations remain low in some major service areas south of the Delta and below average water supply conditions still persist in the Klamath and Lake Tahoe basins


Photography: DWR

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